



Mark 10™ Powerline Electronic Fluorescent Dimming Ballasts



for Linear Fluorescent and 4-Pin CFL Lamps



100% light output to...



... 5% light output

Product Profile

The Advance Mark 10 *Powerline* ballast is the full-range electronic dimming ballast for fluorescent lighting systems. The Mark 10 *Powerline* combines the long life and energy efficiency of fluorescent lamps with the controllability and full-range dimming capabilities of incandescent systems. The Mark 10 *Powerline* requires no additional wiring, making it an easy-to-install retrofit option.

Applications

New construction and retrofit installations where dimming is desired:

New construction and retrofit installations

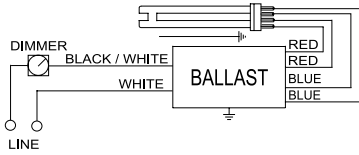
- Auditoriums and Training Areas
- Conference Rooms and Boardrooms
- Department Stores and Specialty Stores
- Educational Facilities
- Healthcare Facilities
- Hotels
- Houses of Worship
- Private and Executive Offices
- Restaurants

Design Highlights

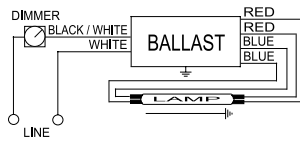
- 100% - 5% full range continuous dimming (T5/HO to 1%)
 - Adds flexibility to system
 - Improves visual comfort
- Energy efficient
 - Provides up to 65% energy savings over standard fixed output T8 ballasts
- No additional control leads
 - Easy to install - requires no extra wiring
 - Flexibility - operates with wide choice of controls from over 20 control manufacturers
- Programmed Start operation
 - Optimizes lamp life in frequent starting conditions
- Lamp ignition at any light setting, including the 5% dim level (1% in T5/HO)
 - Eliminates the need to ramp up to 100% light output when starting
- Operates above 42 kHz
 - Minimizes risk of interference with infrared remote control systems and provides continuous flicker-free dimming
- Lamp EOL protection circuit (CFL and T5/HO models only)
 - Safely removes power from lamp at end of life
 - Prevents lamp overheating

electronic dimming ballast

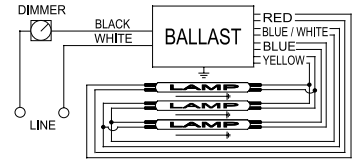
1-Lamp FT40W Ballast - Fig. 134



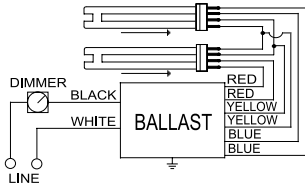
1-Lamp T8 Ballast - Fig. 152



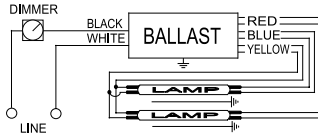
3-Lamp T8 Ballast - Fig. 155



2-Lamp FT40W Ballast - Fig. 132



2-Lamp T8 Ballast - Fig. 153



Control Types

The desired light level can be controlled using the following:

- Wallbox Dimmer
- Occupancy Sensor
- Theatrical Control Panel
- Wallbox/Occupancy Dimmer
- Remote Control via Computer
- Architectural Dimmer
- Total Building Lighting Control System

T8 Linear



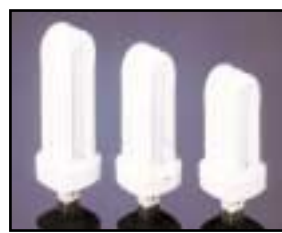
Long Twin Tube



T5/HO



Triple Tube 4-Pin CFL



Quad Tube 4-Pin CFL



Fig. A

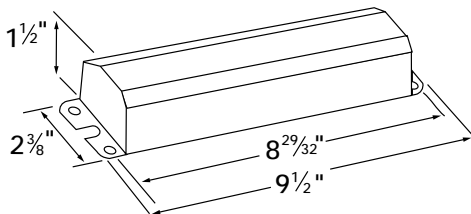


Fig. M2*

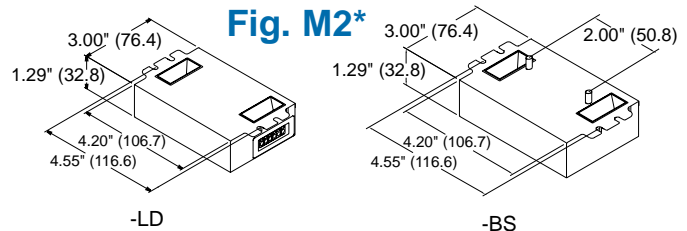


Fig. M3*

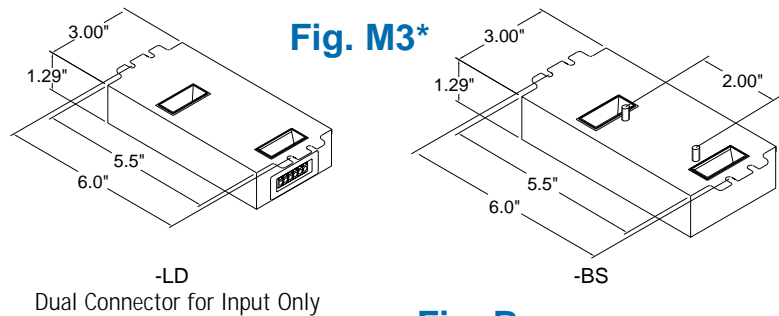
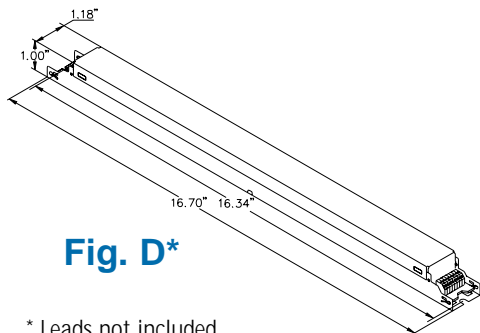
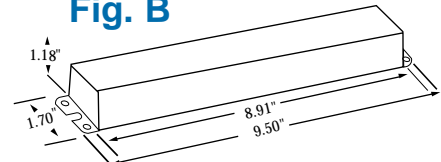


Fig. D*



* Leads not included

Fig. B



- NOTE:
1. One and Two-lamp ballasts may be remote mounted up to six feet away from lamps. Three lamp ballasts may not be remote mounted.
 2. 1⁵/₈" and 6" U-bend lamps also acceptable.
 3. Lamps must be mounted within 3/4" of a ground plane.

T8 Lamp Guide

Lamp Data		Min. Starting Temp. (°F/°C)	Input Volts	Catalog Number	Certifications		Line Current (Amps)	Input Power ANSI (Watts) max/min	Ballast Factor max/min	Max. THD % (at full light output)	Min. Power Factor	Dim./ Wiring Diagram
Number	Watts				UL	SQ						
F17T8, FBO16T8												
1	17	50/10	120	REZ-132-SC	✓	✓	0.20	24/7	1.05/0.05	10	0.99	Fig. B/152
			277	VEZ-132-SC	✓	✓	0.09					
2	17	50/10	120	REZ-2S32-SC	✓	✓	0.32	38/13	1.05/0.05	10	0.99	Fig. B/153
			277	VEZ-2S32-SC	✓	✓	0.14					
3	17	50/10	120	REZ-3S32-SC	✓	✓	0.47	56/18	1.05/0.05	10	0.99	Fig. B/155
			277	VEZ-3S32-SC	✓	✓	0.21					
F25T8, FBO24T8												
1	25	50/10	120	REZ-132-SC	✓	✓	0.26	30/7	1.05/0.05	10	0.99	Fig. B/152
			277	VEZ-132-SC	✓	✓	0.11					
2	25	50/10	120	REZ-2S32-SC	✓	✓	0.46	55/13	1.05/0.05	10	0.99	Fig. B/153
			277	VEZ-2S32-SC	✓	✓	0.20					
3	25	50/10	120	REZ-3S32-SC	✓	✓	0.66	79/19	1.05/0.05	10	0.99	Fig. B/155
			277	VEZ-3S32-SC	✓	✓	0.29					
F32T8, FBO31T8, F32T8/U6												
1	32	50/10	120	REZ-132-SC	✓	✓	0.29	35/9	1.00/0.05	10	0.99	Fig. B/152
			277	VEZ-132-SC	✓	✓	0.13					
2	32	50/10	120	REZ-2S32-SC	✓	✓	0.57	68/15	1.00/0.05	10	0.99	Fig. B/153
			277	VEZ-2S32-SC	✓	✓	0.25					
3	32	50/10	120	REZ-3S32-SC	✓	✓	0.86	102/20	1.00/0.05	10	0.99	Fig. B/155
			277	VEZ-3S32-SC	✓	✓	0.37					

T5/HO Lamp Guide

Lamp Data		Min. Starting Temp. (°F/°C)	Input Volts	Catalog Number	Certifications		Line Current (Amps)	Input Power ANSI (Watts) max/min	Ballast Factor max/min	Max. THD % (at full light output)	Min. Power Factor	Dim./ Wiring Diagram
Number	Watts				UL	SQ						
F54T5/HO												
1	54	50/10	120	REZ-154	✓	✓	0.53	63/12.5	1.00/0.03	10	0.98	Fig. D/152
			277	VEZ-154	✓	✓	0.23					
2	54	50/10	120	REZ-2S54	✓	✓	1.05	125/24	1.00/0.03	10	0.98	Fig. D/153
			277	VEZ-2S54	✓	✓	0.45					
FC12T5/HO (55W Circline)												
1	55	50/10	120	REZ-154	✓	✓	0.50	59/12.5	0.90/0.03	10	0.98	Fig. D/152
			277	VEZ-154	✓	✓	0.22					
2	55	50/10	120	REZ-2S54	✓	✓	0.96	114/24	0.90/0.03	10	0.98	Fig. D/153
			277	VEZ-2S54	✓	✓	0.42					

Compact Fluorescent Lamp Guide

Lamp Data		Min. Starting Temp. (°F/°C)	Input Volts	Catalog Number	Certifications		Line Current (Amps)	Input Power ANSI (Watts) max/min	Ballast Factor max/min	Max. THD % (at full light output)	Min. Power Factor	Dim./ Wiring Diagram
Number	Watts				UL	CSA						
CFQ18W/G24q - 18W CFL Quad Tube Lamp (PL-C18W/4P, F18DBX/4P, CF18DD/E)												
CFTR18W/GX24q - 18W CFL Triple Tube Lamp (PL-T18W, F18TBX/4P, CF18DT/E)												
1	18	50/10	120	REZ-1Q18-M2-①	✓	✓	0.18	22/7	1.00/0.05	10	0.98	Fig.M2/134
			277	VEZ-1Q18-M2-①	✓	✓	0.07					
2	18	50/10	120	REZ-2Q18-M2-①	✓	✓	0.36	43/14	1.00/0.05	10	0.98	Fig.M2/132
			277	VEZ-2Q18-M2-①	✓	✓	0.16					
CFQ26W/G24q - 26W CFL Quad Tube Lamp (PL-C26W/4P, F26DBX/4P, CF26DD/E)												
CFTR26W/GX24q - 26W CFL Triple Tube Lamp (PL-T26W, F26TBX/4P, CF26DT/E)												
1	26	50/10	120	REZ-1T42-M2-①*	✓	✓	0.26	31/8	1.00/0.05	10	0.98	Fig.M2/134
			277	VEZ-1T42-M2-①*	✓	✓	0.11					
2	26	50/10	120	REZ-2Q26-M2-①*	✓	✓	0.48	58/16	1.00/0.05	10	0.98	Fig.M2/132
			277	VEZ-2Q26-M2-①*	✓	✓	0.21					
CFTR32W/GX24q - 32W CFL Triple Tube Lamp (PL-T32W, F32TBX/4P, CF32DT/E)												
1	32	50/10	120	REZ-1T42-M2-①*	✓	✓	0.32	38/9	1.00/0.05	10	0.98	Fig.M2/134
			277	VEZ-1T42-M2-①*	✓	✓	0.14					
2	32	50/10	120	REZ-2T42-M3-①	✓	✓	0.64	76/20	1.00/0.05	10	0.98	Fig.M3/132
			277	VEZ-2T42-M3-①	✓	✓	0.28					
CFTR42W/GX24q - 42W CFL Triple Tube Lamp (PL-T42W, F42TBX/4P, CF42DT/E)												
1	42	50/10	120	REZ-1T42-M2-①*	✓	✓	0.41	49/10	1.00/0.05	10	0.99	Fig.M2/134
			277	VEZ-1T42-M2-①*	✓	✓	0.18					
2	42	50/10	120	REZ-2T42-M3-①	✓	✓	0.82	98/20	1.00/0.05	10	0.98	Fig.M3/132
			277	VEZ-2T42-M3-①	✓	✓	0.36					
CFTR57W/GX24q - 57W CFL Triple Tube Lamp (F57QBX/4P, CF57DT/E)												
1	57	50/10	120	REZ-2T42-M3-①	✓	✓	0.55	66/18	1.00/0.05	10	0.98	Fig.M3/134
			277	VEZ-2T42-M3-①	✓	✓	0.24					
CFTR70W/GX24q - 70W CFL Triple Tube Lamp (F70QBX/4P, CF70DT/E)												
1	70	50/10	120	REZ-2T42-M3-①	✓	✓	0.67	80/18	1.00/0.05	10	0.98	Fig.M3/134
			277	VEZ-2T42-M3-①	✓	✓	0.29					

* Retrofit/replacement kits available in these models, contact factory

① Add suffix -BS for bottom mounting studs with single color-coded connector or -LD for length mounting feet with dual-entry color-coded connectors.

Lamp Data		Min. Starting Temp. (°F/°C)	Input Volts	Catalog Number	Certifications		Line Current (Amps)	Input Power ANSI (Watts) max/min	Ballast Factor max/min	Max. THD % (at full light output)	Min. Power Factor	Dim./ Wiring Diagram
Number	Watts				UL	CSA						
FT36W/2G11 - 36W Long Twin Tube Lamp (PL-L36W, F39/36BX, FT36DL)												
1	36	50/10	120	REZ-1TTS40-SC**	✓	✓	0.32	38/9	1.00/0.03	10	0.99	Fig. B/134
			277	VEZ-1TTS40-SC**	✓	✓	0.14					
2	36	50/10	120	REZ-2TTS40-SC**	✓	✓	0.64	75/16	1.00/0.03	10	0.99	Fig. B/132
			277	VEZ-2TTS40-SC**	✓	✓	0.27					
FT40W/2G11/RS - 40W Long Twin Tube Lamp (PL-L40W, F40/30BX, FT40DL/RS)												
1	40	50/10	120	REZ-1TTS40*/REZ-1TTS40-SC**	✓	✓	0.34	41/10	1.00/0.05	10	0.98	Fig. A**/134
			277	VEZ-1TTS40*/VEZ-1TTS40-SC**	✓	✓	0.15					
2	40	50/10	120	REZ-2TTS40*/REZ-2TTS40-SC**	✓	✓	0.68	80/17	1.00/0.05	10	0.98	Fig. A**/132
			277	VEZ-2TTS40*/VEZ-2TTS40-SC**	✓	✓	0.30					
FT55W/2G11 - 55W Long Twin Tube Lamp (F55BX, FT55DL)												
1	55	50/10	120	REZ-154	✓	✓	0.50	59/13	0.90/0.03	10	0.98	Fig. D/134
			277	VEZ-154	✓	✓	0.22					
2	55	50/10	120	REZ-2S54	✓	✓	0.96	114/24	0.90/0.03	10	0.98	Fig. D/132
			277	VEZ-2S54	✓	✓	0.42					

* To be replaced with - SC 1Q 2004

** To replace large can units 1Q 2004

Advance Mark 10 *Powerline* Ballast Specifications

Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with color coded poke-in wire trap connectors or color coded integral leads as per ANSI C82.11.
- 1.3 Ballast shall be available in a plastic/metal can or all metal can construction to meet all plenum requirements.

Section II - Performance Requirements

- 2.1 Ballast shall be Programmed Start
- 2.2 Ballast shall have a minimum ballast factor of 1.00 at maximum light output and 0.05 at minimum light output for primary lamp application.
- 2.3 Ballast shall maintain constant light output, for line voltage variations of $\pm 10\%$ of rated supply voltage.
- 2.4 Ballast shall control lamp light output from 100% - 5% relative light output for T8 and CFL lamps and 100 - 1% relative light output for T5/HO lamps.
- 2.5 Ballast shall ignite the lamps at any light output setting without first going to another output setting.
- 2.6 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.7 Ballast shall have a Power Factor greater than 0.98 at full light output and greater than 0.90 throughout the dimming range for primary lamp.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less throughout the dimming range in accordance with lamp manufacturer recommendations.
- 2.9 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.10 Ballast shall have a Class A sound rating.
- 2.11 Ballast shall be high frequency electronic type and operate lamps above 42kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.12 Ballast shall provide Lamp (EOL) protection circuit for all T5, T5/HO, and CFL lamps.
- 2.13 Ballast shall operate from 60 Hz input source of 120V or 277V with sustained variations of $\pm 10\%$ (voltage and frequency) with no damage to the ballast.

2.14 Ballast shall have a minimum starting temperature of 10°C (50°F).

2.15 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% at maximum light output when operated at nominal line voltage with primary lamp. Total Harmonic Current (THC) at maximum light output shall not exceed THC at maximum light output.

Section III - Regulatory Requirements

- 3.1 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR Part 18, Non-Consumer (Class A) for EMI/RFI (Conducted and Radiated).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P, Type 1 Outdoor; and Canadian Standards Association (CSA) Certified, where applicable.
- 3.3 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.4 Ballast shall comply with ANSI C82.11, where applicable.
- 3.5 Ballast shall comply with ANSI C62.41 category A for transient protection.

Section IV - Other

- 4.1 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.
- 4.2 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.3 Ballast shall be controlled by a compatible Mark 10 *Powerline* two-wire dimmer.
- 4.4 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70°C.

Use Mark 10 Powerline when you're looking for...

- Total lighting control
- Building management systems compatibility
 - Emergency lighting systems
 - Cleaning schedules
 - Daylight harvesting
 - High/low occupancy and safety applications
 - Places control in energy manager's hands, not individuals
- Unlimited flexibility in lighting controls
- Energy management applications
- Remote controllability
 - Internet-based control schemes
- Retail applications where skylights are utilized

Control Manufacturers for Advance **Mark 10** POWERLINE

MANUFACTURER

ALM Systems, Inc.
AMX Corporation
Automated Logic Corp.
Avab America
Blackbird
Colortran, Inc.
Crestron Electronics
Digital Lighting Systems
Douglas Lighting Controls
Electronic Theatre Controls
Electronics Diversified, Inc.
Hubbell Building Automation
Hunt Dimming
Leax Controls
Lehigh Electronic Products Co.
Leviton Lighting Control Division

MANUFACTURER

Lighting Control and Design
Lightolier Controls
Lithonia Controls
Lutron
Marlin Controls
NexLight
Payne Sparkman
PDM Electrical Products
PLC Multipoint
Sternor Controls
Strand Lighting
Touch-Plate Lighting
Vantage Lighting Control and Automation
Vara-Light / Dimatronics / HUB
Watt Stopper, Inc.



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